Previous references.

G. M. **File No.** 284-10

1911.

Serial Nos. 1-17

(Genl. Misc.)

Later references.

GENERAL AND REVENUE SECRETARIAT.

Serial Nos. 1-17

Part B. for December 1911.

SUBJECT.

Invention of Mr. Edward Evans and Co, London for 'improvements in and relating to the Softening of water'.

Contents.

1. From Messrs. Edward Evans & Co. London Letter dt 12-8-11. Forwards application of William Edward Evans for leave to file a Spec.n of the above named invention.
2. To the Dy Treasury Supt Bangalore. No. G. 7233 dt 13-6-11 Forwards Rs-10/- being the application fee received with the above.
3. To the Supdt of Stamps &c. No. G. 7234 dt 13-6-11. Forwards the Power of Attorney & Re-1/- received with Sl. 1 and requests that the former may be returned duly impressed with a general stamp of the value of Re-1/-

4.

G. R. S. 58

K. N. Krishnaswamy Ayr

4 To the State Geologist No. G.7235 dt 13.6.11.
Forwards for report the application received with dl. 1.

5. From the D.C Treasury dept, Bangalore No. 70/421 dt 14.6.11
Acknowledgs receipt of Rs. 10/- sent with dl. 2.

6. From the State Geologist. No. 2534 dt 24.6.1911
Forwards the report called for in dl. 4.

7. To Mr. Edward Evans, London No. G.243 dt 11.7.11
Authorizes him to file a specification.

8. To Messrs. Edward Evans & Co. London. No. G.2448 dt 7/11
Forwards a copy of the above for communication to the party concerned.

9. From — dt ———— Letter dt 29.9.11
Forwards Rs. 30/- and 6 Copies of the Specn for being filed.

10. To the Compiler, Mysore Gazette. No. G.2968 dt 21.11.11
Notifies the filing of the specification of the above invention.

11. To Messrs. Edward Evans, & Co. No. G. 2969 dt 21.11.11
Forwards Copy of the above &c.

12. To the Supdt Govt Museum, Chief Engineer & State Geologist. No. G. 2970-72 dt 21.11.11
Forwards for record in his office a copy of the Specn

13. To the D.C Treasury dept Bangalore No. G. 2973 dt 21/11/11
Forwards Rs. 30/- received vide dl. 5.

14. From the State Geologist. No. 973 dt 22.11.11.
Acknowledgs receipt of the Specn sent vide dl. 12

15. From the D.C Treasury dept Bangalore No. 91 dt 23.11.11
Acknowledgs receipt of Rs. 30/- sent vide dl. 13.

16 From the Supdt Govt Museum No. 71 dt 24/11/11
17 From the Chief Engineer No. 11208 dt 5/12/11
} Acknowledge receipt of the Specn sent with dl. 12.

G.R.S.11] 1910-11

GENERAL AND REVENUE SECRETARIAT

(Genl. misc).

Regd. no 11 of 1910-11.

NOTES.

File No. 2821.

FILE HEADING.

Invention of Mr Edward Evans for Improvements in & relating to the softening of water.

From

Messrs Mr Edward Evans & Co. London

No. BL/D. Dated 12-5-1911 Received 24-5-1911

Diary No. 5035	Enclos. 3	Spare Copies	Serial No. 1

BRIEF ABSTRACT OF LETTER.

Forwards applⁿ of Mr Edward Evans for leave to file a Specification of his invention with Power of Attorney &c.

NOTES AND ORDERS.

Issue usual ack. &c. (Re Power of attorney please see note in Rem 283 of 1910-11).

Issuing need 16/4 5/6/11.

Rs (12s) 10-6-11

Approved. As regards fee for Power of Attorney, please see order in the file regd to (Rem. 283 of 10-11) Rs 4/- to be regd

8/6/11

NOTES—First sheet.

GPB—30,000—3-4-07.

G. R. S. 12]
General and Revenue Secretariat.

File No. 2824 of 1910

Serial No.	
2	To D.C. Hy Deptt, Bangalore. No. C. 7233 dt 13. 6. 11. Forwards Rs 10/- being the applⁿ fee recd with the above & requests acknowledgment.
3	To the Supdt of Stamps. No. C. 7234 dt 13. 6. 11 Forwards the Power-of-attorney and Rect/- and requests that the Power may be returned duly impressed with a general stamp of the value of Rs one.
4	To the State Geologist. No. C. 7235 dt 13. 6. 11. Forwards for report the applⁿ recd with Sl 1.
5	From the Officer in charge Distl Hy Bangalore. No. 70/421 dt 14. 6. 11. Acknowledgs receipt of the Rem dt Rs 10 sent with No 2.
6.	From the State Geologist No. 2554 dt 24. 6. 1911 With Ref^e to Sl 4 Opines that the claims appear to be in order and recommends the grant of the leave prayed for. Draft Subd. Hy (125) 4.7.11 Issued 5.7.11
7	To Mr. William Edward Evans, London, W.C. No. C. 2443 dt 11. 7. 11. Authorizes him to file a specifn.
8	To Messrs Edward Evans & Co London. No. C. 2444 dt 11. 7. 11 Forwards copy of the above for communication to the party concerned

Sl 1 Rs 10/-

Rect with Rem Rs 10-5

Return of Power of attorney acknowledged Rem 28-10-8

Exam for recovered & Power of attorney rect. Rem 28-10-8

Rect in Ref

GPB—50,000—12-8-10

G. R. S. 12]
General and Revenue Secretariat.

Gen File No. 284 of 1910

1708

Serial No.	
9	From Messrs Edward Evans & Co, London. Dated 29.9.11 Forwards Rs 30/- and 6 copies of the specification towards filing the specification. The money has been received ~~[illegible]~~ The usual drafts are subd. The G.O. requires signature. Subd. VS.41 9A 99 3.11.11 Issue 4.11.11
10.	To. The Compiler Mysore Gazette No. G 2968 & 21.11.11. Notifies the filing of the specification of the above invention.
11.	To. Messrs Edward Evans & Co. No. G 2969 & 21.11.11. Forwards copy of the above and returns the order granting permission with the certificate at foot duly filled in.
12.	To. The Supdt Govt. Museum, Chief Engineer and State Geologist. No. G 2970-72 & 21.11.11 Enc 1. Forwards for record in his office a copy of the specification of the above invention.
13.	To. The Dy Cmsr. Try Depart. Bangalore. No. G 2973 & 21.11. Forwards Rs 30/- for credit in the Treasury

NOTE— Contn. sheet.

GPB—50,000—12-8-10

G. R. S. 12]
General and Revenue Secretariat.

Gen File No. 284 of 1910-11

Serial No.	
14	From the State Geologist No 973 Dt 22-11-11 Acknowledges the receipt of the Specimen forwarded with Sl 12.
15	From the Dy Sr, Bangalore No 91 Dt 23-11-11 Acknowledges the receipt of Rs 30/- forwarded with Sl 13. Acknowledgements from the Museum Supdt and the Chief Engineer may be awaited. Subd GA 99 27-11-11 VS·41 Jr Asst 27-11-11
16	From the Supdt, Govt Museum No 74 Dt 24-11-11. Acknowledges the receipt of the Specimen forwarded with Sl 12. Acknowledgment from the Chief Engineer may be awaited. Subd GA 99 5-12-11 VS·41 Jr Asst 7-12-11
17	From the Chief Engineer No 11208 Dt 5-12-11. Acknowledges the receipt of the Specimen forwarded with Sl 12. The correspondence may now be filed. Subd GA 99 15-12-11 VS·41 File Asst 16-12-11

Rec'd

NOTE—Contn. sheet.

GPB—50,000—12-8-10

Gn 284-10-) D 50357

Edward Evans & Co.
Consulting Engineers and
Chartered Patent Agents.

ARBITRATORS AND EXPERTS IN PATENT CASES.
FELLOWS OF THE CHARTERED INSTITUTE OF PATENT AGENTS.
ENROLLED PATENT ATTORNEYS OF THE UNITED STATES.

Telephone No. 4916 Holborn.
Telegraphic & Cable Address } Effugium, London.
A.B.C. & A.1. Codes used.

AND AT BIRMINGHAM AND BRISTOL.

BL/D

27, Chancery Lane,
London, W.C.

May 12th 1911.

To the Secretary of the Government of
H.H. the Maharaja of Mysore,
General and Revenue Department,
Bangalore,
Mysore.

Sir,

re Application for Patent in the name of William Edward Evans in respect to the invention entitled "Improvements in and relating to the softening of water".

Herewith we beg to forward Power of Attorney, application in duplicate and drawings in duplicate for filing on application in the above name together with Money Order value 15 Rupees being 10 Rupees for the filing fee, and 5 Rupees for the stamp on the Power of Attorney.

We respectfully request that the certificate of filing may be sent to the above address and leave to file the Complete specification duly granted.

Very respectfully,

Edward Evans & Co

(2)

Case 2

Re 1

POWER OF ATTORNEY

IN THE MATTER of The Inventions and Designs Regulation, XI of 1894, of the Government of Mysore:

and

IN THE MATTER of William Edward Evans Consulting Engineer, of 27, Chancery Lane, London, W.C., England, an Inventor.

I, the above named William Edward Evans, do hereby retain, constitute and appoint Messrs. Edward Evans & Co. of 27 Chancery Lane, London, W.C., England, as my Agents and Attorneys to apply for and obtain from the Government of Mysore an Exclusive Privilege for "Improvements in and relating to the softening of water" and to maintain the same in force; and I authorize them to sign my name to such papers and writings and do such acts regarding the same, including substitution and revocation, as may be necessary or expedient. And lastly, I request that all notices, requisitions and communications now or hereafter relating to the same may be sent to such Agents at the above address, and that they be recognized as my authorized Agents in all proceedings incident thereto.

Dated this 12th day of May. 1911.

Signed, sealed and delivered) W. E. Evans
by the above named William)
Edward Evans at 27 Chancery)
Lane, London, W.C. England,)
in the presence of)

H. A. Blake

R. O. Hughes

HAB

(3)

Case 2

APPLICATION

To

The DEWAN of MYSORE.

The Application of William Edward Evans, Consulting Engineer, of 27, Chancery Lane, London, W.C., England, for leave to file a Specification under Part I of The Inventions and Designs Regulation 1894.

1. The applicant is in possession of an invention for "Improvements in and relating to the softening of water"; he is the inventor thereof, and to the best of his information and belief, the invention is new within the meaning of Part I of The Inventions and Designs Act of 1894; and no circumstance exists which, if the applicant be authorized to file a Specification and files it in accordance with that Part, will disentitle him to an Exclusive Privilege thereunder in respect of the invention; for which application for Letters Patent has been made in the United Kingdom No. 3870 dated the 15th day of February 1911. See Illustrated Official Journal (Patents) No. 1153 page 224.

2. The following is a description of the invention.

(4)

(Case 2).

This invention relates to a process for softening water in the use of zeolites or hydrated alumino-silicates.

The present invention has for its object a process in which the zeolites or alumino-silicates can be used in a filter and be regenerated therein, so as to be capable of continuous use for the softening of water.

The zeolites or hydrated alumino-silicates that occur in nature are ill adapted, without special treatment for the purpose, inasmuch as their capacity for the exchange of their base, upon which their property of softening hard water would depend, is relatively small; while they have little or no capacity for regeneration or reconversion to their original condition whereby they can be continuously used.

Furthermore zeolites or hydrated alumino-silicates for use in softening hard water by mere filtration of the hard water through them, must not only possess a high capacity for exchange of their base, and for regeneration or re-conversion to their original condition, but they must be hard and large grained and adapted by their physical qualities for use as filtering media.

Such zeolites or hydrated alumino-silicates can be artificially produced on the fusion of alumina, quartz and alkali; the melt having approximately the following molecular composition:—

4 Molecules SiO_2, 1 Molecule Al_2O_3, and 4 to 5 Molecules (Na_2O).

The product of this process of fusion is cooled, crushed and leached with hot water, the residue being hard and large grained zeolites especially adapted to the purpose of this invention.

It will be understood that while the invention does not comprise and is not confined to the process of production of the zeolites or alumino-silicates, the following examples are given of melts that will yield products suitable for use according to the invention.

As examples among the many possible compositions, approximately corresponding to the molecular proportion hereinbefore specified (which are so numerous because potassium silicates such as potash felspar, leucite, nepheline, phenolite and the like can be used instead of quartz), are the following:—

(No. 1). 2.0 parts by weight of kaolin.
4.5 „ „ „ „ potash felspar.
8.2 „ „ „ „ sodium carbonate.

These proportions correspond to the molecular composition:—

4 Molecules SiO_2, 1 Molecule Al_2O_3, 5.5 Molecules Na_2O.

The melt must be extracted or leached with hot water by which zeolitic silicates are obtained as hard, large, opal-like grains, which approximately possess the molecular composition:—

2 to 3 Molecules SiO_2, 1 Molecule Al_2O_3, 1 Molecule $(KNa)_2O$, 6 Molecules H_2O,

(No. 2). 2.0 parts by weight of kaolin.
3.5 „ „ „ „ leucite.
1.0 „ „ „ „ quartz.
8.2 „ „ „ „ sodium carbonate, or
7.6 parts by weight of soda.
0.8 „ „ „ „ potash.

This melt has the same molecular composition as the melt No. 1, and yields also the same zeolites.

It will be understood that naturally still smaller quantities of soda may obviously be used in the melt, with about the same reduction in the quantity of silicic acid, or that also slightly larger quantities of soda and quartz, or minerals rich in quartz, still permit of the treatment of the melt obtained, with hot water at from 90-100°C.

The accompanying drawing illustrates diagrammatically, and by way of example a filter in which the process of the invention may be carried into effect.

In carrying the invention into effect, as illustrated in the accompanying drawing a vertical cylindrical casing *a* is provided, closed at the top by a cover plate *b*, and within this casing a number

of horizontally disposed perforated plates, such as *c* and *d*, are suitably mounted.

The perforated plate *c* carries a layer or layers of quartz or sand, through which the water to be softened may be first filtered, while the perforated plate *d* carries a layer of hard coarse grained zeolites *f*, through which the water then passes, the layer of zeolites advantageously having a layer *g* beneath, of quartz or sand.

The water to be softened passes from the supply pipe *k*, through the inlet valve *m*, and inlet pipe *l*, to the filter, passing down the filter layer *e*, thence through the layer of zeolites or aluminosilicates *f*, and the layer of sand or quartz *g*, to the water-collecting chamber *h*, whence it passes through the conical perforated screen *i*, through the outlet pipe *j* and outlet valve *n*.

In operation, the inlet valve *m* for the water to be softened, as well as the outlet valve *n*, are opened, and the water then caused to pass through the filter, and to be completely softened thereby.

After the softening property of the zeolites has been exhausted or reduced, which can be readily ascertained by testing the water passed through, the inlet valve *m* and outlet valve *n* are closed, and a solution of a sodium salt, such as common salt, is passed through the filter by opening the inlet valve *o*, and allowing the solution of salt, after passing through the filter, to pass outwardly through the waste valve *p*.

By such means, it will be understood that the passage of water through the filter may be cut off or diverted, and the regenerating solution may then be passed through, so that the zeolites may be regenerated, and thus the filter is capable of continuous use without the removal of the zeolites from the filter or their renewal.

It is obvious, as a matter of practical convenience that two such filters may be provided, so that one may be used while the zeolites are regenerated in the other, and thus an uninterrupted supply of soft water provided.

Means may be provided for stirring the zeolites, which conveniently may consist of a plate mounted in the casing *a*, so as to be capable of rotation by means of a series of bevel teeth carried by the plate, and pinions gearing therewith, and operable from outside the filter casing. The plate may advantageously have secured to it, a series of rods passing into the zeolites, so that on rotation of the plate, the zeolites are stirred.

The respective layers of filtering material and zeolites may be contained within perforated or other similar removable casings, let into the filter casing *a*, so that the removal of the filtering material and zeolites, from the filter casing, may be facilitated when such is at any time required.

(7)

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:-

1. A process for the softening of hard water, consisting in merely passing the hard water through hard crystalline zeolites or hydrated alumino-silicates until their softening property has been exhausted, then cutting off the supply of water and regenerating the zeolites or alumino-silicates, by merely passing through them a solution of a regenerating salt, until the zeolites are regenerated, and then again passing hard water through the zeolites and so on, substantially as described.

2. A filtering apparatus for the softening of hard water, consisting of a casing carrying a filter bed of hard crystalline zeolites or hydrated alumino-silicates, means for admitting the water to be softened for passage through the filter casing and for cutting off the supply of water therethrough on the exhaustion of the zeolites, and means for passing through the filter casing a solution of a salt capable of regenerating the zeolites, substantially as described.

3. Water softening apparatus substantially as described.

3. The applicant, therefore, applies for leave to file a Specification of the invention pursuant to Part I of the Mysore Inventions and Designs Regulation 1894.

Dated this 12 day of May 1911.

.....

I, William Edward Evans, the applicant above named do declare that what is stated in this Application is true to my knowledge, except as to matters stated on information and belief, and as to those matters I believe them to be true.

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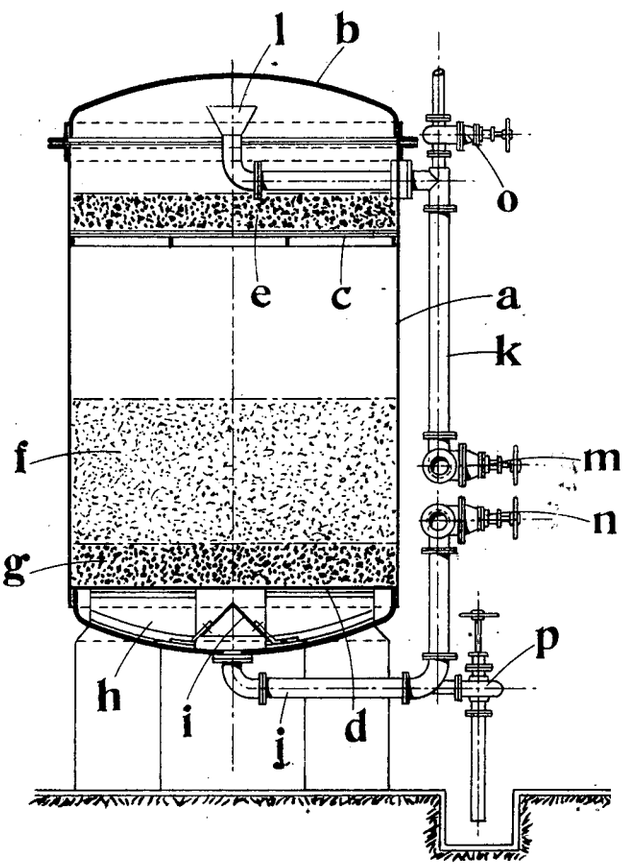
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1910-11

(10)

S P E C I F I C A T I O N.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, William Edward Evans, of 27, Chancery Lane, London, W.C. England, Consulting Engineer, am in possession of an invention registered as No. 11 1910-11 for "Improvements in and relating to the softening of water" and I, the said William Edward Evans, do hereby declare the nature of my said invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement thereof, that is to say:-

This invention relates to a process for softening water in the use of zeolites or hydrated alumino-silicates.

The present invention has for its object a process in which the zeolites or alumino-silicates can be used in a filter and be regenerated therein so as to be capable of continuous use for the softening of water.

The zeolites or hydrated alumino-silicates that occur in nature are all adapted, without special treatment for the purpose, inasmuch as their capacity for the exchange of their base, upon which their property of softening hard water would depend, is relatively small; while they have little or no capacity for regeneration or reconversion to their original condition whereby they can be continuously used.

Furthermore zeolites or hydrated alumino-silicates for use in softening hard water by the filtration of the hard water through them, must not only possess a high capacity for exchange of their base, and for regeneration or re-conversion to their original condition, but they must be hard and have grained and adapted by their physical qualities for use as filtering media.

Such zeolites or hydrated alumino-silicates can be artificially produced on the fusion of alumina, quartz and alkali; the melt having approximately the following molecular composition:- 4 Molecules SiO_2, 1 Molecule Al_2O_3, and 4 to 5 Molecules (Na_2O).

The product of this process of fusion is cooled, crushed and leached with hot water, the residue being hard and large grained zeolites especially adapted to the purpose of this invention.

It will be understood that while the invention does not comprise and is not confined to the process of production of the zeolites or alumino-silicates, the following examples are given of melts that will yield products suitable for use according to the invention.

As examples among the many possible compositions, approximately corresponding to the molecular proportion hereinbefore specified (which are so numerous because potassium silicates such as potash felspar, leucite, nepheline, phonolite and the like can be used instead of quartz) are the following:-

No. 1 2.0 parts by weight of kaolin.
4.5 " " " " potash felspar.
8.2 " " " " sodium carbonate.

These proportions correspond to the mole-

colar composition:-

4 Moleculos SiO_2, 1 Moleculo Al_2O_3, 5.6 Moleculos Na_2O.

The melt must be extracted or leached with hot water by which zeolitic silicates are obtained as hard, large, opal-like grains, which approximately possess the molecular composition:-

2 to 3 Moleculos SiO_2, 1 Moleculo Al_2O_3, 1 Moleculo $(KNa)_2O$, 6 Moleculos H_2O.

No. 2. 2.0 parts by weight of kaolin.
3.5 " " " " leucite.
1.0 " " " " quartz.
6.2 " " " " sodium carbonate or
7.6 parts by weight of soda.
0.0 " " " " potash.

This melt has the same molecular composition as the melt No. 1, and yields also the same zeolites.

It will be understood that naturally still smaller quantities of soda may obviously be used in the melt, with about the same reduction in the quantity of silicic acid, or that also slightly larger quantities of soda and quartz or minerals rich in quartz still permit of the treatment of melt obtained, with hot water at from 90-100° C.

The accompanying drawing illustrates diagrammatically and by way of example, a filter in which the process of the invention may be carried into effect.

In carrying the invention into effect, as illustrated in the accompanying drawing a vertical cylindrical casing a is provided, closed at the top by a cover plate b and within this casing a number of horizontally disposed perforated plates such as c and d are suitably mounted.

The perforated plate c carries a layer or layers of quartz or sand, through which the water to be softened may be first filtered, while the perforated plate d carries a layer of hard coarse grained zeolites f through which the water then passes, the layer of zeolites advantageously having a layer g beneath of quartz or sand.

The water to be softened passes from the supply pipe k through the inlet valve m and inlet pipe l to the filter, passing down the filter layer e thence through the layer of zeolites or alumino-silicates f and the layer of sand or quartz g to the water-collecting chamber h, whence it passes through the conical perforated screen i through the outlet pipe j and outlet valve n.

In operation, the inlet valve m for the

(15)

water to be softened, as well as the outlet valve n are opened, and the water then caused to pass through the filter and to be completely softened thereby.

After the softening property of the zeolites has been exhausted or reduced, which can be readily ascertained by testing the water passed through the inlet valve m and outlet valve n are closed, and a solution of a sodium salt, such as common salt, is passed through the filter by opening the inlet valve o and allowing the solution of salt, after passing through the filter, to pass outwardly through the waste valve p.

By such means it will be understood that the passage of water through the filter may be cut off or diverted and the regenerating solution may then be passed through, so that the zeolites may be regenerated and thus the filter is capable of continuous use without the removal of the zeolites from the filter or their renewal.

It is obvious as a matter of practical convenience that two such filters may be provided, so that one may be used while the zeolites are regenerated in the other, and thus an uninterrupted supply of soft water provided.

Means may be provided for stirring the zeolites, which conveniently may consist of a plate

mounted in the casing a so as to be capable of rotation by means of a series of bevel tooth carried by the plate, and pinions gearing therewith, and operable from outside the filter casing. The plate may advantageously have secured to it, a series of rods passing into the zeolites so that on rotation of the plate, the zeolites are stirred.

The respective layers of filtering material and zeolites may be contained within perforated or other similar removable casings, let into the filter casing a so that the removal of the filtering material and zeolites, from the filter casing, may be facilitated when such is at any time required.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:-

1. A process for the softening of hard water, consisting in merely passing the hard water through hard crystalline zeolites or hydrated alumino-silicates until their softening property has been exhausted, then cutting off the supply of water and regenerating the zeolites or alumino-silicates, by merely passing through them a solution of regenerating salt, until the zeolites are regenerated and then again passing hard water through the zeolites

(17)

and so on, substantially as described.

2. A filtering apparatus for the softening of hard water, consisting of a casing carrying a filter bed of hard crystalline zeolites or hydrated alumino-silicates, means for admitting the water to be softened for passage through the filter casing and for cutting off the supply of water therethrough on the exhaustion of the zeolites, and means for passing through the filter casing a solution of a salt capable of regenerating the zeolites, substantially as described.

3. Water softening apparatus substantially as described.

DATED this 29th day of September 1911.

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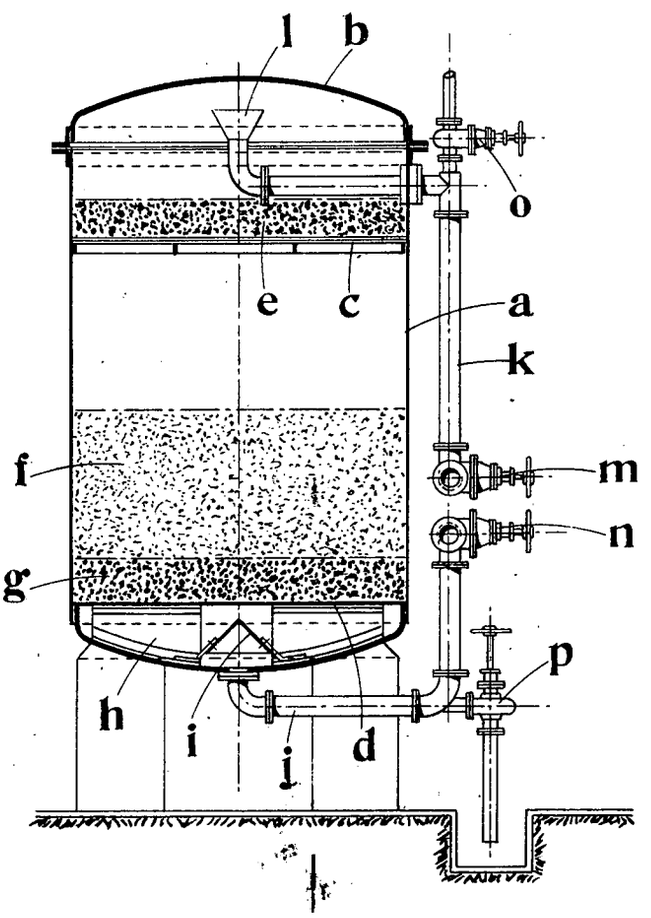
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No. 11
1910-11

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, William Edward Evans, of 27, Chancery Lane, London, W.C. England, Consulting Engineer, am in possession of an invention registered as No. // 1910/11 for "Improvements in and relating to the softening of water" and I, the said William Edward Evans, do hereby declare the nature of my said invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement thereof, that is to say:-

This invention relates to a process for softening water in the use of zeolites or hydrated alumino-silicates.

The present invention has for its object a process in which the zeolites or alumino-silicates can be used in a filter and be regenerated therein, so as to be capable of continuous use for the softening of water.

The zeolites or hydrated alumino-silicates that occur in nature are ill adapted, without special treatment for the purpose, inasmuch as their capacity for the exchange of their base, upon which their property of softening hard water would depend, is relatively small; while they have little or no capacity for regeneration or reconversion to their original condition whereby they can be continuously used.

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Such zeolites or hydrated alumino-silicates can be artificially produced on the fusion of alumina, quartz and alkali; the melt having approximately the following molecular composition:- 4 Molecules SiO_2, 1 Molecule Al_2O_3, and 4 to 5 Molecules (Na_2O).

The product of this process of fusion is cooled, crushed and leached with hot water, the residue being hard and large grained zeolites especially adapted to the purpose of this invention.

It will be understood that while the invention does not comprise and is not confined to the process of production of the zeolites or alumino-silicates, the following examples are given of melts that will yield products suitable for use according to the invention.

An example among the many possible compositions, approximately corresponding to the molecular proportion hereinbefore specified (which are so numerous because potassium silicates such as potash felspar, leucite, nepheline, phonolite and the like can be used instead of quartz), are the following:-

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4.0 " " " " potash felspar.
8.0 " " " " sodium carbonate.

These proportions correspond to the mole-

ular composition:-

4 Molecules SiO_2, 1 Molecule Al_2O_3, 5.6 Molecules Na_2O.

The melt must be extracted or leached with hot water by which zeolitic silicates are obtained as hard, large, opal-like grains, which approximately possess the molecular composition:-

3 to 3 Molecules SiO_2, 1 Molecule Al_2O_3, 1 Molecule $(KNa)_2O$, 6 Molecules H_2O.

No. 3. 3.0 parts by weight of kaolin.

3.6 " " " " leucite.

1.0 " " " " quartz,

0.2 " " " " sodium carbonate or

7.3 parts by weight of soda.

0.3 " " " " potash.

This melt has the same molecular composition as the melt No. 1, and yields also the same zeolites.

It will be understood that naturally still smaller quantities of soda may obviously be used in the melt, with about the same result as in the quantity of silicic acid, or that also slightly larger quantities of soda and quartz or minerals rich in quartz still permit of the treatment of melt obtained, with hot water at from 90-100° C.

The accompanying drawing illustrates diagrammatically and by way of example, a filter in which the process of the invention may be carried into effect.

In carrying the invention into effect, as illustrated in the accompanying drawing a vertical cylindrical casing a is provided, closed at the top by a cover plate b, and within this casing a number of horizontally disposed perforated plates, such as c and d are suitably mounted.

The perforated plate c carries a layer or layers of quartz or sand, through which the water to be softened may be first filtered, while the perforated plate d carries a layer of hard coarse grained zeolites e, through which the water then passes, the layer of zeolites advantageously having a layer g beneath of quartz or sand.

The water to be softened passes from the supply pipe k through the inlet valve m and inlet pipe l to the filter, passing down the filter layer c thence through the layer of zeolites or alumino-silicates e and the layer of sand or quartz g to the water-collecting chamber h, whence it passes through the conical perforated screen i through the outlet pipe j and outlet valve n.

In operation, the inlet valve m for the

water to be softened, as well as the outlet valve n are opened, and the water then caused to pass through the filter and to be completely softened thereby.

After the softening property of the zeolites has been exhausted or reduced, which can be readily ascertained by testing the water passed through the inlet valve m and outlet valve n are closed, and a solution of a sodium salt, such as common salt, is passed through the filter by opening the inlet valve o and allowing the solution of salt, after passing through the filter, to pass outwardly through the waste valve p.

By such means it will be understood that the passage of water through the filter may be cut off or diverted, and the regenerating solution may then be passed through, so that the zeolites may be regenerated, and thus the filter is capable of continuous use without the removal of the zeolites from the filter or their renewal.

It is obvious as a matter of practical convenience that two such filters may be provided, so that one may be used while the zeolites are regenerated in the other, and thus an uninterrupted supply of soft water provided.

Means may be provided for stirring the zeolites, which conveniently may consist of a plate

mounted in the casing a so as to be capable of rotation by means of a series of bevel teeth carried by the plate, and pinions gearing therewith, and operable from outside the filter casing. The plate may advantageously have secured to it, a series of rods passing into the zeolites, so that on rotation of the plate, the zeolites are stirred.

The respective layers of filtering material and zeolites may be contained within perforated or other similar removable casings, let into the filter casing a so that the removal of the filtering material and zeolites, from the filter casing, may be facilitated when such is at any time required.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:-

1. A process for the softening of hard water, consisting in merely passing the hard water through hard crystalline zeolites or hydrated alumino-silicates until their softening property has been exhausted, then cutting off the supply of water and regenerating the zeolites or alumino-silicates, by merely passing through them a solution of [illegible] ting salt, until the zeolites are regenerated, then again passing hard water through the zeolites

(96)

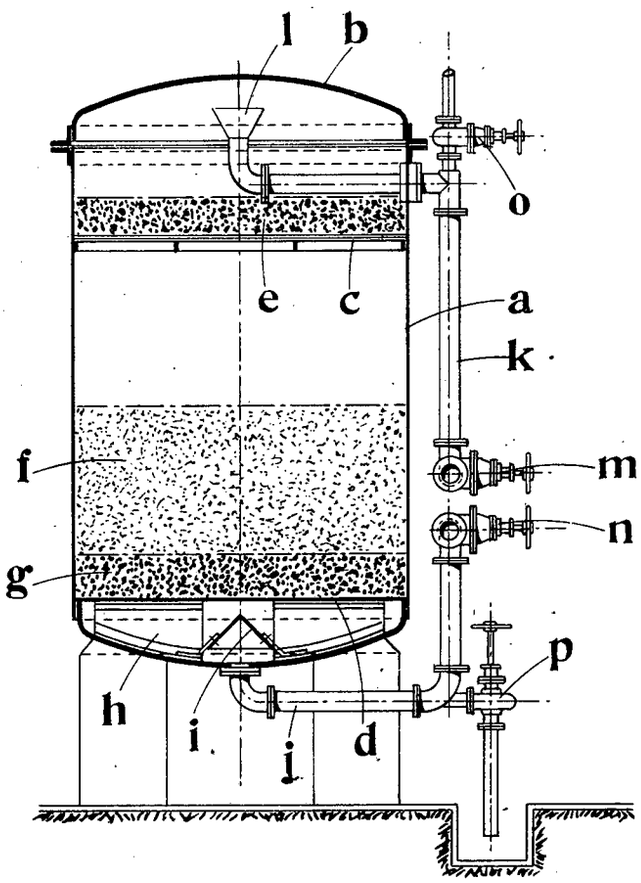
and so on, substantially as described.

2. A filtering apparatus for the softening of hard ater, consisting of a casing carrying a filter bed of hard crystalline zeolites or hydrated alumino-silicates, means for admitting the water to be softened for passage through the filter casing and for cutting off the supply of water therethrough on the exhaustion of the zeolites, and means for passing through the filter casing a solution of a salt capable of regenerating the zeolites, substantially as described.

3. Water softening apparatus substantially as described.

DATED this 29th day of September 1911.

.....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G.R.S. 29A]

190 . (28)

From

Secy. to the Govt. of His Highness the Maharaja of Mysore, Genl. and Rev. Dept.

To

The Dy. Com[illegible]

Dated Dy Deptt

Despatched 13. 6. 11 Bangalore

Received

General No. C 7233

Gen No. 284 - 10 - 2

Enclosure No. Rs Twenty -

I Has the honor to forward herewith for credit a sum of Rs 10 ~~being the~~ ~~received from~~ Messrs being the applr's fee in respect of the invention of Mrs Edward Evans for "Improvements relating to the softening of water" and to request the favour of an acknowledgement.

I have the honor
Sir
Your most obedient
servant
[illegible]
8/6/11

MGCPB—20,000—16-2-05

Inward Cover up
14/5/11 To Dept I

G.R.S. 29A]

190

From

Secy. to the Govt. of His Highness the Maharaja of Mysore, Genl. and Rev. Dept.

To

The Supdt of Stamps.

Dated

Despatched 13. 6. 11

Received

General No. G 7234
Fin No. 284-10-3

Enclosure No. 1 + Remarks

Has the honor to request that the enclosed Power of Attorney constituting messrs Edward Evans & Co agents for Wm Edward Evans in respect of his invention for "Improvements in & relating to the softening of water" may be impressed with a General Stamp of the value of Rs One & returned to this office. A sum of Rs One is herewith forwarded &c.

Blank Wbe filled up.

MGCPB—20,000—16-2-05

8/6/11

3/15

G.R.S. 20A]

190 . (30)

From

Secy. to the Govt. of His Highness the Maharaja of Mysore, Genl. and Rev. Dept.

To

? —— The State Geologist

Dated

Despatched 13 . 6 . 11

Received

General No. G 7235

Gen No. 284-10-4

Enclosure No. 1

Has the honor to forward herewith for favour of enquiry & report under Mysore Part I of the Inventions Designs Regln XI of 1894 the applⁿ of Wm Edward Evans for leave to file a specification of his invention for "Improvts in & relating to the softening of water."

8/6/11

Delhi

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(87)

Ch 284 10:5

Rs 10/— Book No. 1012 D926 No 421

Bangalore — Treasury dated 14-6-11

16/6/11 Received from Secretary to Treasury & Ex-officio Assistant

Rupees Ten only

Annas — and Pies — being on account of

Application fee in respect of inventions of William Edmund Evans for improvements in and relating to the softening of water"

In charge of Treasury.

Bangalore

M.G.D. 13] MYSORE GEOLOGICAL DEPARTMENT.

(32)

Dated Bangalore, 24th June 1911

No. 2554/Enc.1

G. M. 284-10-6

From.

E. W. WETHERELL, Esq., A.R.C.S., F.R.P.S.L., F.G.S.,
Offg. State Geologist in Mysore.

C.S. Balasundaram Iyer, Esquire, B.A.
Offg. Secretary to the Government of His Highness
the Maharaja of Mysore, Gen.& Rev. Depts.

Sir,

In reply to your docket No.G.7235/Gen.No.284-10-6 dated 13th June 1911, I have the honour to inform you that the specification referred to therein appears to me to be more detailed than the specification of the invention for "Improvement in and relating to Zeolites &c " received with your docket No.7232, dated 13th June 1911. The claims appear to be in order and the permission sought for to file the specification may be granted.

2. The specification is herewith returned.

I have the honour to be,
Sir,
Your most obedient servant,

E. W. Wetherell

C.N. Offg. State Geologist in Mysore.

Case 2 (33)

APPLICATION

To

The DEWAN of MYSORE.

The Application of William Edward Evans, Consulting Engineer, of 27, Chancery Lane, London, W.C., England, for leave to file a Specification under Part I of The Inventions and Designs Regulation 1894.

1. The applicant is in possession of an invention for "Improvements in and relating to the softening of water"; he is the inventor thereof, and to the best of his information and belief, the invention is new within the meaning of Part I of The Inventions and Designs Act of 1894; and no circumstance exists which, if the applicant be authorized to file a Specification and files it in accordance with that Part, will disentitle him to an Exclusive Privilege thereunder in respect of the invention; for which application for Letters Patent has been made in the United Kingdom No. 3870 dated the 15th day of February 1911. See Illustrated Official Journal (Patents) No. 1153 page 224

2. The following is a description of the invention.

(Case 2).

This invention relates to a process for softening water in the use of zeolites or hydrated alumino-silicates.

The present invention has for its object a process in which the zeolites or alumino-silicates can be used in a filter and be regenerated therein, so as to be capable of continuous use for the softening of water.

The zeolites or hydrated alumino-silicates that occur in nature are ill adapted, without special treatment for the purpose, inasmuch as their capacity for the exchange of their base, upon which their property of softening hard water would depend, is relatively small; while they have little or no capacity for regeneration or reconversion to their original condition whereby they can be continuously used.

Furthermore zeolites or hydrated alumino-silicates for use in softening hard water by mere filtration of the hard water through them, must not only possess a high capacity for exchange of their base, and for regeneration or re-conversion to their original condition, but they must be hard and large grained and adapted by their physical qualities for use as filtering media.

Such zeolites or hydrated alumino-silicates can be artificially produced on the fusion of alumina, quartz and alkali; the melt having approximately the following molecular composition:—

4 Molecules SiO_2, 1 Molecule Al_2O_3, and 4 to 5 Molecules (Na_2O).

The product of this process of fusion is cooled, crushed and leached with hot water, the residue being hard and large grained zeolites especially adapted to the purpose of this invention.

It will be understood that while the invention does not comprise and is not confined to the process of production of the zeolites or alumino-silicates, the following examples are given of melts that will yield products suitable for use according to the invention.

As examples among the many possible compositions, approximately corresponding to the molecular proportion hereinbefore specified (which are so numerous because potassium silicates such as potash felspar, leucite, nepheline, phenolite and the like can be used instead of quartz), are the following:—

(No. 1). 2.0 parts by weight of kaolin.
4.5 „ „ „ „ potash felspar.
8.2 „ „ „ „ sodium carbonate.

These proportions correspond to the molecular composition:—

4 Molecules SiO_2, 1 Molecule Al_2O_3, 5.5 Molecules Na_2O.

The melt must be extracted or leached with hot water by which zeolitic silicates are obtained as hard, large, opal-like grains, which approximately possess the molecular composition:—

2 to 3 Molecules SiO_2, 1 Molecule Al_2O_3, 1 Molecule $(KNa)_2O$, 6 Molecules H_2O,

(No. 2). 2.0 parts by weight of kaolin.
3.5 „ „ „ „ leucite.
1.0 „ „ „ „ quartz.
8.2 „ „ „ „ sodium carbonate, or
7.6 parts by weight of soda.
0.8 „ „ „ „ potash.

This melt has the same molecular composition as the melt No. 1, and yields also the same zeolites.

It will be understood that naturally still smaller quantities of soda may obviously be used in the melt, with about the same reduction in the quantity of silicic acid, or that also slightly larger quantities of soda and quartz, or minerals rich in quartz, still permit of the treatment of the melt obtained, with hot water at from 90-100°C.

The accompanying drawing illustrates diagrammatically, and by way of example a filter in which the process of the invention may be carried into effect.

In carrying the invention into effect, as illustrated in the accompanying drawing a vertical cylindrical casing *a* is provided, closed at the top by a cover plate *b*, and within this casing a number

of horizontally disposed perforated plates, such as *c* and *d*, are suitably mounted.

The perforated plate *c* carries a layer or layers of quartz or sand, through which the water to be softened may be first filtered, while the perforated plate *d* carries a layer of hard coarse grained zeolites *f*, through which the water then passes, the layer of zeolites advantageously having a layer *g* beneath, of quartz or sand.

The water to be softened passes from the supply pipe *k*, through the inlet valve *m*, and inlet pipe *l*, to the filter, passing down the filter layer *e*, thence through the layer of zeolites or aluminosilicates *f*, and the layer of sand or quartz *g*, to the water-collecting chamber *h*, whence it passes through the conical perforated screen *i*, through the outlet pipe *j* and outlet valve *n*.

In operation, the inlet valve *m* for the water to be softened, as well as the outlet valve *n*, are opened, and the water then caused to pass through the filter, and to be completely softened thereby.

After the softening property of the zeolites has been exhausted or reduced, which can be readily ascertained by testing the water passed through, the inlet valve *m* and outlet valve *n* are closed, and a solution of a sodium salt, such as common salt, is passed through the filter by opening the inlet valve *o*, and allowing the solution of salt, after passing through the filter, to pass outwardly through the waste valve *p*.

By such means, it will be understood that the passage of water through the filter may be cut off or diverted, and the regenerating solution may then be passed through, so that the zeolites may be regenerated, and thus the filter is capable of continuous use without the removal of the zeolites from the filter or their renewal.

It is obvious, as a matter of practical convenience that two such filters may be provided, so that one may be used while the zeolites are regenerated in the other, and thus an uninterrupted supply of soft water provided.

Means may be provided for stirring the zeolites, which conveniently may consist of a plate mounted in the casing *a*, so as to be capable of rotation by means of a series of bevel teeth carried by the plate, and pinions gearing therewith, and operable from outside the filter casing. The plate may advantageously have secured to it, a series of rods passing into the zeolites, so that on rotation of the plate, the zeolites are stirred.

The respective layers of filtering material and zeolites may be contained within perforated or other similar removable casings, let into the filter casing *a*, so that the removal of the filtering material and zeolites, from the filter casing, may be facilitated when such is at any time required.

Having now particularly described and ascertained the nature of my said Invention and in what manner the same is to be performed, I declare that what I claim is:-

1. A process for the softening of hard water, consisting in merely passing the hard water through hard crystalline zeolites or hydrated alumino-silicates until their softening property has been exhausted, then cutting off the supply of water and regenerating the zeolites or alumino-silicates, by merely passing through them a solution of a regenerating salt, until the zeolites are regenerated, and then again passing hard water through the zeolites and so on, substantially as described.

2. A filtering apparatus for the softening of hard water, consisting of a casing carrying a filter bed of hard crystalline zeolites or hydrated alumino-silicates, means for admitting the water to be softened for passage through the filter casing and for cutting off the supply of water therethrough on the exhaustion of the zeolites, and means for passing through the filter casing a solution of a salt capable of regenerating the zeolites, substantially as described.

3. Water softening apparatus substantially as described.

(38)

3. The applicant, therefore, applies for leave to file a Specification of the invention pursuant to Part I of the Mysore Inventions and Designs Regulation 1894.

Dated this 12 day of May 1911.

W. E. Evans

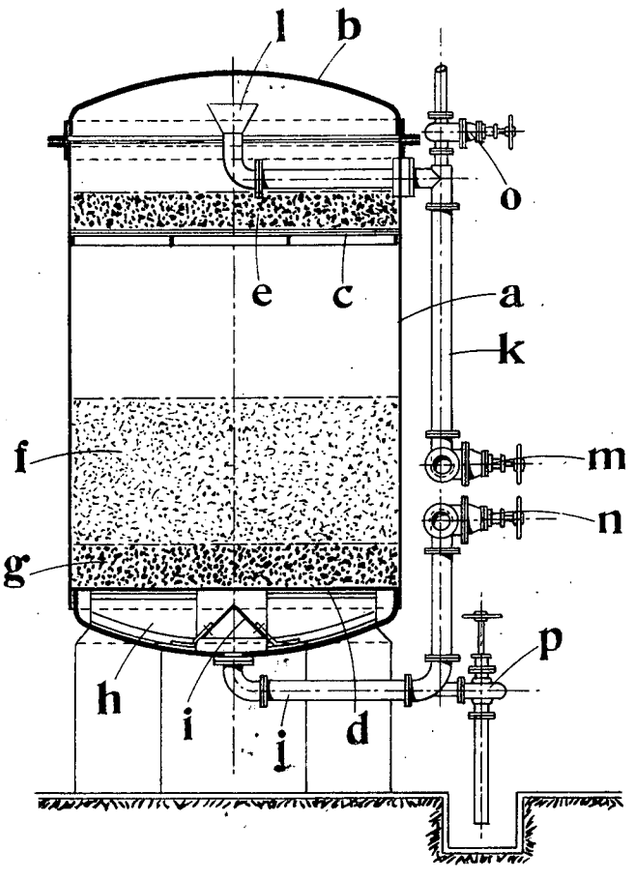
.....

I William Edward Evans, the applicant above named do declare that what is stated in this Application is true to my knowledge, except as to matters stated on information and belief, and as to those matters I believe them to be true.

W. E. Evans

.....

Hsd.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No G 243
Gen 284-10-7

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GOVERNMENT OF MYSORE

General Department.

Register No. 11 **of 1910 - 11**

Bangalore, the 11th July 1911

WHEREAS an application, dated the 12th Day of May 1911 and received on the 29th Day of May 1911, has been submitted under Section 5 of the Mysore Inventions and Designs Regulation, 1894, by William Edward Evans, Consulting Engineer of 27, Chancery Lane, London W.C.

(hereinafter referred to as "the applicant") for leave to file a specification of an invention for "Improvements in and relating to the softening of water.".

And whereas the applicant has duly complied with all the requirements of Section 5 of the said Regulation;

The Government of Mysore are pleased, under Section 6 of the said Regulation, to authorize the applicant to file a specification of the said invention in accordance with the provisions of the said Regulation.

ORDERED, that the applicant be, and he is hereby, informed accordingly.

By Order of the Government of Mysore,

5.7.11

Secretary to the Govt. of Mysore,
Gen. and Rev. Depts.

Certified that the fees prescribed in the fourth schedule to the Mysore Inventions and Designs Regulation, 1894, in respect of the application for leave to file the said specification and of the filing thereof have been paid by the applicant, and that the specification hereinbefore described has been duly filed in accordance with the provisions of Section 8 of the said Regulation on this the Fourth day of November 1911.

4/11/11.

Secretary to the Govt. of Mysore,
Gen. and Rev. Depts.

VS. 41

(*Section* 8 *of the Inventions and Designs Regulation*, 1894.)

8. (1) If within six months from the date of an order under Section 6, Sub-Section (1), or within such further time, not exceeding three months, as the Government of Mysore, in its discretion, may, on cause shown to its satisfaction and on payment of the fee prescribed in that behalf in the fourth schedule, see fit to allow, the applicant causes a specification of his invention to be filed in manner by this Part required, and the fee prescribed in the fourth schedule in respect of the filing of the specification to be paid, the applicant shall, subject to the other provisions of this Part, be entitled to the exclusive privilege of making, selling and using the invention in the Territories of Mysore, and of authorizing others so to do, for a term of fourteen years from the date of the filing of the specification.

(2) But an exclusive privilege in respect of an invention of a new manufacture shall, notwithstanding anything in Sub-Section (1), cease, if the inventor fails to pay, within the time limited in that behalf by the fourth schedule, any fee prescribed in that schedule in respect of the continuance of the privilege.

(3) If, nevertheless, in any case, by accident, mistake, or inadvertence, an inventor fails to pay any such fee within the time so limited, he may apply to the Government of Mysore for an enlargement of the time for making the payment.

(4) Thereupon the Government of Mysore may enlarge the time accordingly, on payment of the fee prescribed in that behalf in the fourth schedule, and subject to the following conditions, namely:—

(*a*) the time for making a payment shall not in any case be enlarged for more than three months; and

(*b*) if any suit is instituted in respect of an infringement of the exclusive privilege committed after a failure to make a payment within the time limited for the making thereof and before the enlargement of that time, the Court disposing of the suit may, if it thinks fit, refuse to award or give any damages in respect of the infringement.

GPB—150—30-7-06

G.R.S. 26]

5200/5/7

Diary No. of letter replied to

General and Revenue Secretariat

( )

, the 19 .

Date of issue 11. 7. 11

Signed by Md Bhanamisamiengar

Gen File No. 284-11

Serial No. 8

No. G 244 Encl

To

Messrs Edward Evans & Co

27, Chancery Lane, London W.C.

Gentlemen,

With ref^e to your letter no B.L./D, 12.5.1911, I am directed to forward herewith for communication to the applicant an order granting leave to Mr. Edward Evans to file a specification of his invention for "Improvements in and relating to the softening of water".

I have &c.

5.7.11

for Secretary

over.

SUBJECT.

Copies 16/7/11

DIARY No. 1708
9

9/1 -1912

SECTION Gen : Mis

FILE No. 284 of 1910-11

No. 189

Edward Evans & Co
Consulting Engineers and
Chartered Patent Agents.

ARBITRATORS AND EXPERTS IN PATENT CASES.
FELLOWS OF THE CHARTERED INSTITUTE OF PATENT AGENTS.
ENROLLED PATENT ATTORNEYS OF THE UNITED STATES.

Telephone No. 4916 Holborn.
Telegraphic & Cable Address } Effugium, London.
A.B.C. & A1. Codes used.

AND AT BIRMINGHAM AND BRISTOL.

BL/D

27, Chancery Lane,
London, W.C.

Sept. 29th 1911.

C.S. Balasundaram Iyer, Esq., B.A.,
Officiating Secretary to the Government
of H.H. the Maharaja of Mysore,
General & Revenue Dept.,
Bangalore,
Mysore.

Sir,

re Mysore Application No. 11/10-11. William Edward Evans in respect to "Improvements in and relating to the softening of water".

Herewith we beg to return parchment together with six copies of the specification and respectfully request that the parchment may be duly returned to us.

We also forward hereby by Money Order 30 Rupees being the filing fee herein and respectfully request that the official certificate may be sent to us in due course.

Very respectfully,

4 Nov 5

2 copies

1788/4/11

No. 2968
G.M. 284-10-10.

MYSORE GOVT. GEN. & REV. SECRETARIAT,

Dated Bangalore, 21st November 1911

NOTIFICATION.

(PATENT.)

The following specification of an invention has been filed in accordance with Sections 8, 9, 10 and 11 of Regulation XI of 1894 (The Inventions and Designs Regulations) and is open to inspection at the Mysore Government Secretariat on application to the Secretary to the Government of His Highness the Maharaja of Mysore, General and Revenue Departments, and on payment of a fee of one Rupee.

By William Edward Evans, Consulting Engineer of 27 Chancery Lane, London, W.C.

"Improvements in and relating to the softening of water."

By Order,

4/11/11.

for the Secretary.

To

The Compiler, *Mysore Gazette*, for publication VS. 41

No. G 2969. Ele 2
Gen: 284-10-11

MYSORE-GOVT GEN. & REV. SECRETARIAT

Dated Bangalore, 21st November 1911

From

The Secretary to the Government of H. H. the Maharaja of Mysore,
General and Revenue Departments.

To

Messrs Edward Evans & Co
27, Chancery Lane,
London WC

~~Sir~~, Gentlemen,

With reference to your letter dated the 29th Sept. 1911 I am directed to forward copy of a Notification No. G 2968 dated 21. 11. 11. issued by this Government in regard to the invention filed by you under Regulation XI of 1894 (The Inventions and Designs Regulations.) for communication to the party concerned

The order granting permission to file specification is herewith returned, with the certificate at foot, duly filled in and signed.

I have the honor to be,
~~Sir~~, Gentlemen,
Your most obedient servant,

4.11.11.

for ops *Secretary.*

VS. 41

3

4 offs

G.R.S. 29A]

19 .

From

The Offg Secy. to the Govt. of His Highness
The Maharaja of Mysore,
Genl. and Rev. Dept.

To
(1) The Supdt, Govt Museum.
(2) .. Chief Engineer.
(3) .. State Geologist,

Dated

Despatched 21st November 1911.

Received

General No. G 2970-72.
No. Gen 284-10-12

Enclosure No. 1 Specification

Has the honor to forward herewith for record in his office a copy of the specification in respect of an invention for "Improvements in and relating to the softening of water" by William Edward Evans, and request the favor of an acknowledgment.

By order,

4.11.11.

for Offg Secretary.

VS.41

GPB—20,000—24-10-10.

Money received issued
23/11/11

G.R.S. 29A]

4 Offs

19 .

From

Secy. to the Govt. of His Highness
The Maharaja of Mysore,
Genl. and Rev. Dept.

1208/4/11

To

The Deputy Commissioner,
Treasury Deptt,
Bangalore Dt.

Dated

Despatched 21. November 1911

Received

General No. G 2973.

No. for 1911-10-13

Enclosure No. Rs 30/-.

Has the honor to forward herewith for credit in the Treasury a sum of Rs 30/- received from Messrs Edward Evans & Co. London, being the fee paid under cl 2 of Schedule IV of the Inventions and Designs Regn XI of 1894 for filing a specification in respect of an invention for "Improvements in and relating to the softening of water" by William Edward Evans, and to request the favor of an acknowledgment.

By Order

4.11.11.

for Secretary

GPB—20,000—24-10-10.

15.41

M.G.D. 13]

MYSORE GEOLOGICAL DEPARTMENT.

Dated Bangalore, 22nd November *1911*.

No. 973

DIARY No. 2230 *From*

1911 -1912

SECTION fin: mis

FILE No. 2874 of 1910-11

SERIAL No. 14 *To*

E. W. WETHERELL, Esq., A.R.C.S., F.R.P.S.L., F.G.S.,
Offg. State Geologist in Mysore.

C.S. Balasundaram Iyer, Esquire, B.A.,
Offg.Secretary to the Government of His Highness
the Maharaja of Mysore,Gen.& Rev. Depts.

Sir,

I have the honour to acknowledge the receipt of a copy of the specification in respect of an invention for "Improvements in and relating to the softening of water" forwarded with your docket No.G.2970-72/G.M.284-10-12,dated 21st November 1911 for record in this ~~Department.~~ office.

I have the honour to be,
Sir,
Your most obedient servant,

C.N.

Offg.State Geologist in Mysore.

GPB—480—4-1-11

(A)

fm 284-10-15

91

Rs. 30-0-0 Book No. 1013 No. 91

Bangalore District Treasury dated 23rd November 1911.

Received from The Secretary G.L. & Rev. Departments

Rupees Thirty only -

Annas — and Pies — being on account of

fee recd. from Messrs Edward Evans & Coy. for filing a specification in respect of an invention for "Improvements in and relating to the Softening of water"

Receipt No. G 2973 of 21-11-11.

Epn. 284-10-13

In charge of Treasury.

No. 74

OFFICE OF THE ECONOMIC BOTANIST,
SUPERINTENDENT, MYSORE GOVERNMENT MUSEUM,
Bangalore, dated 24th November 1911.

DIARY No. 2371

1911-1912
SECTION for : Mis
Bangalore No. 284 of 1910-11
SERIAL No. 46

FROM

G. H. KRUMBIEGEL, ESQ., F.R.H.S.,
Economic Botanist,
Superintendent, Mysore Govt. Museum,

To

C. S. Balasundram Iyer Esq,
Offg. Secretary to the Govt. of H. H.
the Maharaja of Mysore,
Genl. and Rev. Depttts.,
Bangalore.

Sir,

I have the honor to acknowledge the receipt of a copy of the Specification of an invention for "Improvements in and relating to the Softening of water" by William Edward Evans, forwarded with your No. G. 2970-72 / G. H. 284-10-2 dated the 21st instant.

I have the honor to be,

Sir,

Your most obedt. Servant

G. H. Krumbiegel

Economic Botanist,

Superintendent, Mysore Museum,

Bangalore.

VGA
4/12

19 11

From

G. H. KRUMBIEGEL, Esq., F.R.H.S.,
Economic Botanist,
Supt., Mysore Govt. Museum,
Bangalore.

To C S. Balasundaram Iyer Esq BA.
Offg. Secretary to the Govt. of H.H.
The maharaja of Mysore.
Gen. and Rev. Depts
Bangalore

Dated 24th Nov. 1911

Despatched 2nd Dec. 1911

Received

General No. 74 } 1911-12
No.

Enclosure No.

Acknowledging the receipt of a copy of the Specification of an invention for "Improvements in and relating to the Softening of waters" by W. E. Evans.

GPB—300—15 7 10

No. //2087

MYSORE P. W. DEPARTMENT,
CENTRAL OFFICE.

Bangalore, 5th December.....191 1.

From

~~M. VISVESVARAYA, Esq.~~

The *Chief Engineer of Mysore*,
Bangalore.

DIARY No. 2427
1911-1912
SECTION Gen: Mis
FILE No. 284 of 1910-11
SERIAL No. 17

To

The Secretary to Government,
General and Revenue Departments.

Sir,

I have the honour to acknowledge the receipt of the copy of the specification in respect of an invention for "Improvements in and relating to the softening of water" filed by Mr. William Edward Evans of London, forwarded with your No. G.2970-72/G.M.28 4-10-12 dated the 21st November 1911.

I have the honour to be,
Sir,
Your most obedient servant,

Deputy Chief Engineer,
For Chief Engineer,
Mysore P.W.Department.

S.S.

V 7/12 GA

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MYSORE P. W. DEPARTMENT.

No. 11208

From

THE CHIEF ENGINEER OF MYSORE,
Bangalore.

To The Secretary to the Govern-ment. Genl. & Rev. Depts.

Dated Bangalore, 5th Dec. 1911

Despatched

Enclosure No.

SUBJECT.

Specification relating to the softening of water